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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/521,567	08/29/2005	Kiyoshi Miyashita	5759-0101PUS1	4049
2292 7590 06/11/2009 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				
EXAMINER RADEMAKER, CLAIRE L				
ART UNIT 1795		PAPER NUMBER		
NOTIFICATION DATE 06/11/2009		DELIVERY MODE ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary

Application No.

10/521,567

Applicant(s)

MIYASHITA ET AL.

Examiner

CLAIRE L. RADEMAKER

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12/11/08, 3/18/09.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2 and 4-43 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-2 & 4-43 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 1/18/2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SF/08)
Paper No(s)/Mail Date 12/11/08
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. This office action is in response to the amendment filed on March 18, 2009. Claims 1-2 & 4-43 are pending and are rejected for reasons of record. Claim 3 is cancelled.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-2, 4-9 & 31-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kroll et al. (US 3,412,174) in view of Reb et al. (US 2002/0187172).

With regard to claims 1-2, 4-9, & 31-37, Kroll et al. teaches a colloidal solution preparing method for forming colloidal particles from solution containing a metal salt and a reducing agent (col. 2, lines 1-3, 7-11, & 43-47), wherein the concentration of the metal salt in the solution is 0.001% to 1% based on feed to the reaction (for example the solution can contain 0.4mM of the metal salt, as shown in Example 2) (col. 6, lines 3-43 & col. 7, lines 72-75), the concentration of the reducing agent is 10 to 50 times, preferably 10 to 20 times, where the equivalent concentration of the metal salt (col. 5, lines 43-48 & col. 7, lines 72-75), and where the reaction time is 1 minute to 10 hours

(col. 6, lines 36-38), wherein the metal salt can be platinum salt (col. 42, lines 1-3 & 7-11) such that platinum colloidal particles are formed, and wherein the reducing agent can be a sodium organometallic compound (col. 2, lines 43-47), but fails to teach the concept of boiling the solution or teach the specified size of the platinum colloidal particles formed.

Reb et al. teaches that a solution of platinum salt (metal salt) (paragraph [0062]) and sodium citrate (reducing agent) (paragraph [0068]) can be boiled in order to increase the rate of the reaction of making platinum colloidal particles (paragraphs [0068]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the concept of boiling the metal salt and reducing agent solution of Reb et al. to the method of making colloidal particles from a solution of metal salt and reducing agent of Kroll et al. in order to increase the rate of the reaction (paragraph [0068]). Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add the concept of using sodium citrate as a reducing agent of Reb et al. to the method of Kroll et al. because sodium citrate is a type of sodium organometallic and is known to be an effective reducing agent for platinum salt and one would have reasonable expectation of success in doing so.

Modified Kroll et al. fails to teach the specified size of the platinum colloidal particles formed.

While modified Kroll et al. fails to teach the specified size of the platinum colloidal particles formed, one of ordinary skill in the art would expect that the size of the

platinum colloidal particles of modified Kroll et al. would be comparable to that of the instant application, due to the specified method of making said platinum colloidal particles (boiling, concentrations used, reaction time) and the specified compounds used (platinum salt (metal salt) and sodium citrate (reducing agent)).

Furthermore, the Examiner notes that one of ordinary skill in the art would understand that the amount of metal salt used can be increased or decreased depending on how much end product (colloidal particles) is desired. Furthermore, one of ordinary skill in the art would understand that the ratio of metal salt to reducing agent can be varied in order to optimize the purity of the end product (colloidal particles). One of ordinary skill in the art would understand that if too little reducing agent is used, then not all of the metal salt will be reduced, causing the end product (colloidal particles) to contain unwanted unreacted metal salt. Furthermore, one of ordinary skill in the art would understand that if too much reducing agent is used, then the end product (colloidal particles) will contain unwanted unreacted reducing agent. One of ordinary skill in the art would understand that it is common practice in a laboratory to adjust the ratio of reactants (such as a metal salt and a reducing agent) in order to optimize the purity of the end product (in this instance, colloidal particles). It has been held that "[w]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation" (MPEP 2144.05(II)).

4. Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kroll et al. (US 3,412,174) and Reb et al. (US 2002/0187172), as applied to claim 7 above, and further in view of Le Duc et al. (US 3,235,473).

With regard to claims 10-12, modified Kroll et al. fails to teach that the colloidal particles are fixed to a substrate, the specified composition of said substrate, or that said substrate is porous.

Le Duc et al. teaches that a colloidal solution made from a metal salt, chloroplatinic acid (col. 3, lines 33-36), and a reducing agent, sodium citrate (col. 3, lines 69-70), can be fixed on the surface of a substrate by applying said colloidal solution to said substrate (col. 5, lines 25-28 & 43-46), where said substrate can comprise of woven glass, porous glass, or PTFE coated fiber glass (woven) (col. 2, lines 33-36 & 59-64).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the concept applying the colloidal solution (catalyst) to a substrate comprising of woven glass or porous glass of Le Duc et al. to the invention of modified Kroll et al. because woven glass and porous glass are known to be effective substrates for a colloidal solution (catalyst) and one would have a reasonable expectation of success in doing so.

5. Claims 13-30 & 38-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Le Duc et al. (US 3,235,473) in view of Kroll et al. (US 3,412,174) and Reb et al. (US 2002/0187172).

With regard to claims 13-30 & 38-43, Le Duc et al. teaches a method for manufacturing fuel cell electrodes for a fuel cell (col. 1, lines 8-13) by:

Making a colloidal solution from a metal salt, chloroplatinic acid (a platinum salt) (col. 3, lines 33-36), and a reducing agent, sodium citrate (col. 3, lines 69-70), and fixing said colloidal solution on the surface of a substrate by applying said colloidal solution to said substrate (col. 5, lines 25-28 & 43-46), where said substrate can comprise of woven glass, porous glass, or PTFE coated fiber glass (woven) (col. 2, lines 33-36 & 59-64), but fails to specifically state that the platinum colloid particles are a low-oxidation catalyst, teach the specified method of making said colloidal solution, or teach the specified size of the colloidal particles formed.

While Le Duc et al. fails to specifically state that the platinum colloid particles are a low-temperature oxidation catalyst, one of ordinary skill in the art at the time of the invention would understand that this property is inherent to the compound, and that therefore the platinum colloid particles of Le Duc et al. would have the same properties, such as low-temperature oxidation, as the colloid particles of the instant application.

Kroll et al. teaches a colloidal solution preparing method for forming colloidal particles from solution containing a metal salt and a reducing agent (col. 2, lines 1-3, 7-11, & 43-47), wherein the concentration of the metal salt in the solution is 0.001% to 1%

based on feed to the reaction (for example the solution can contain 0.4mM of the metal salt, as shown in Example 2) (col. 6, lines 3-43 & col. 7, lines 72-75), the concentration of the reducing agent is 10 to 50 times, preferably 10 to 20 times, where the equivalent concentration of the metal salt (col. 5, lines 43-48 & col. 7, lines 72-75), and where the reaction time is 1 minute to 10 hours (col. 6, lines 36-38), wherein the metal salt can be platinum salt (col. 42, lines 1-3 & 7-11) such that platinum colloidal particles are formed, and wherein the reducing agent can be a sodium organometallic compound (col. 2, lines 43-47), but fails to teach the concept of boiling the solution or teach the specified size of the colloidal particles formed.

It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the method of making the colloidal solution of Le Duc et al. with the method of making a colloidal solution of Kroll et al. because this is a known method of making a colloidal solution (catalyst) and one would have a reasonable expectation of success in doing so.

Modified Le Duc et al. fails to teach the concept of boiling the solution or teach the specified size of the colloidal particles formed.

Reb et al. teaches that a solution of platinum salt (metal salt) (paragraph [0062]) and sodium citrate (reducing agent) (paragraph [0068]) can be boiled in order to increase the rate of the reaction of making platinum colloidal particles (paragraphs [0068]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the concept of boiling the metal salt and reducing agent solution of Reb

et al. to the method of making colloidal particles from a solution of metal salt and reducing agent of modified Le Duc et al. in order to increase the rate of the reaction (paragraph [0068]). Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add the concept of using sodium citrate as a reducing agent of Reb et al. to the method of modified Le Duc et al. because sodium citrate is a type of sodium organometallic and is known to be an effective reducing agent for platinum salt and one would have reasonable expectation of success in doing so.

Modified Le Duc et al. fails to teach the specified size of the platinum colloidal particles formed.

While modified Le Duc et al. fails to teach the specified size of the platinum colloidal particles formed, one of ordinary skill in the art would expect that the size of the platinum colloidal particles of modified Le Duc et al. would be comparable to that of the instant application, due to the specified method of making said platinum colloidal particles (boiling, concentrations used, reaction time) and the specified compounds used (chloroplatinic acid (a platinum salt) and sodium citrate (reducing agent)).

Furthermore, the Examiner notes that one of ordinary skill in the art would understand that the amount of metal salt used can be increased or decreased depending on how much end product (colloidal particles) is desired. Furthermore, one of ordinary skill in the art would understand that the ratio of metal salt to reducing agent can be varied in order to optimize the purity of the end product (colloidal particles). One of ordinary skill in the art would understand that if too little reducing agent is used, then

not all of the metal salt will be reduced, causing the end product (colloidal particles) to contain unwanted unreacted metal salt. Furthermore, one of ordinary skill in the art would understand that if too much reducing agent is used, then the end product (colloidal particles) will contain unwanted unreacted reducing agent. One of ordinary skill in the art would understand that it is common practice in a laboratory to adjust the ratio of reactants (such as a metal salt and a reducing agent) in order to optimize the purity of the end product (in this instance, colloidal particles). It has been held that "[w]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation" (MPEP 2144.05(II)).

Response to Arguments

Claim Objections

6. Applicant's arguments with regard to the objections to claims 2-5 & 7 regarding typographical errors, filed on March 18, 2009, have been fully considered and the Examiner's objections are withdrawn due to the Applicant's amendments and arguments.

Claim Rejections - 35 USC § 103

7. Applicant's arguments with respect to claims 1-2 & 4-30, filed on March 18, 2009, have been considered but are moot in the view of the new ground(s) of rejection. The

new grounds of rejection are necessitated by the Applicants amendment and all arguments are directed toward the added limitation "wherein the metal salt is a platinum salt; platinum colloidal particles are formed; and an average diameter of the platinum colloidal particles is 1 to 5 nm" being added to claims 1-2 & 4-7.

8. Applicant's arguments with respect to claims 1-2 & 4-30, filed on March 18, 2009, have been considered but are not persuasive.

On pages 14-15 of the Applicant's Response, the Applicants note that the Examiner made mathematical mistakes in calculating the concentration of the metal salt and reducing agent in the prior Office Action (Applicant's Response, pages 14-15).

In response to the Applicant's statement that the Examiner made mathematical mistakes in calculating the concentration of the metal salt and reducing agent in the prior Office Action (Applicant's Response, pages 14-15), the Examiner maintains that while Gram et al. fails to teach the specified amount of metal salt, and sometimes the specified ratio of metal salt to reducing agent, that one of ordinary skill in the art would understand that the amount of metal salt used can be increased or decreased depending on how much end product (colloidal particles) is desired. Furthermore, one of ordinary skill in the art would understand that the ratio of metal salt to reducing agent can be varied in order to optimize the purity of the end product (colloidal particles). One of ordinary skill in the art would understand that if too little reducing agent is used, then

not all of the metal salt will be reduced, causing the end product (colloidal particles) to contain unwanted unreacted metal salt. Furthermore, one of ordinary skill in the art would understand that if too much reducing agent is used, then the end product (colloidal particles) will contain unwanted unreacted reducing agent. One of ordinary skill in the art would understand that it is common practice in a laboratory to adjust the ratio of reactants (such as a metal salt and a reducing agent) in order to optimize the purity of the end product (in this instance, colloidal particles). It has been held that "[w]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation" (MPEP 2144.05(II)).

On page 15 of the Applicant's Response, Applicants argue that "manufacturing conditions of silver colloidal particles cannot be applied to the preparation of platinum colloidal particles" and that "even assuming that these conditions could be applied to the preparation of platinum colloidal particles, the platinum colloidal particles having a small average particle diameter and high catalytic activity could not be formed" (Applicant's Response, page 15).

The Examiner respectfully disagrees with the Applicants argument that that "manufacturing conditions of silver colloidal particles cannot be applied to the preparation of platinum colloidal particles" and that "even assuming that these conditions could be applied to the preparation of platinum colloidal particles, the

platinum colloidal particles having a small average particle diameter and high catalytic activity could not be formed" (Applicant's Response, page 15) because the Examiner has found that silver colloidal particles and platinum colloidal particles are often made by the same process (see Reb et al. (US 2002/0187172), paragraph [0062]) and Kroll et al. (US 3,412,174), col. 2, lines 1-11)) and because Graham et al. (US 6,127,120) specifically clearly teaches that the average particle diameter of said colloidal particles is 4-50nm (col. 11, lines 47-51). Furthermore, one of ordinary skill in the art would expect that the size of the colloidal particles of modified Graham et al. would be comparable to that of the instant application, due to the specified method of making said colloidal particles (boiling, concentrations used, reaction time) and the specified compounds used (chloroplatinic acid (a metal salt) and sodium citrate (reducing agent)).

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CLAIRE L. RADEMAKER whose telephone number is (571)272-9809. The examiner can normally be reached on Monday - Friday, 8:00AM - 4:30PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C. L. R./
Examiner, Art Unit 1795

/Alexa D. Neckel/
Supervisory Patent Examiner, Art Unit 1795